TELEPHONY

THE JOURNAL OF THE TELEPHONE INDUSTRY

AUGUST 23, 1941

VOLUME 121

NUMBER 8

XUM

New FULL LENGTH TREATMENT *for* NORTHERN WHITE CEDAR POLES

P&H

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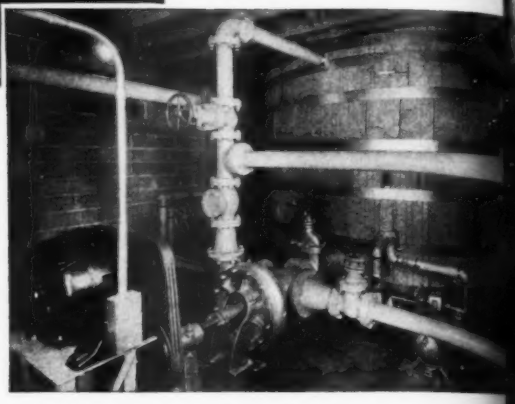

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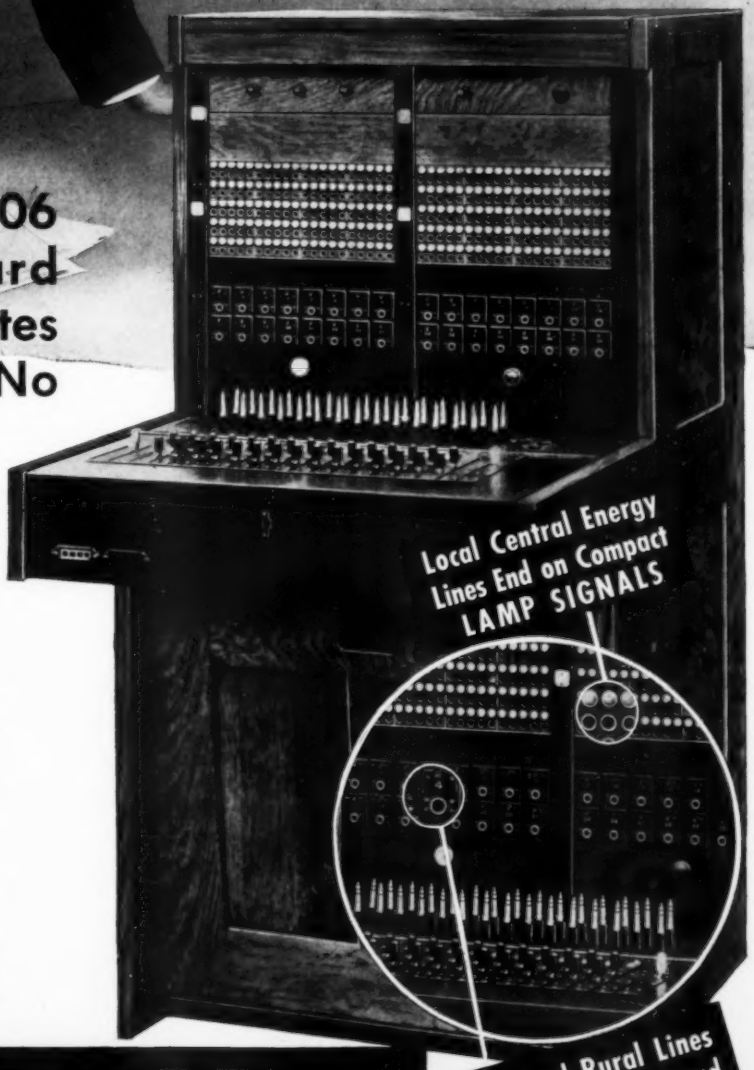
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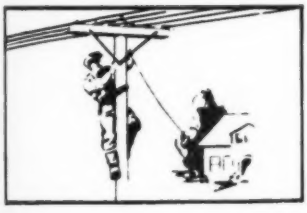

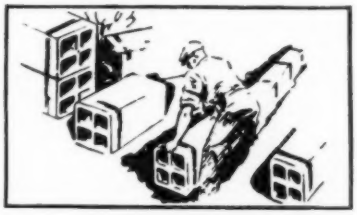

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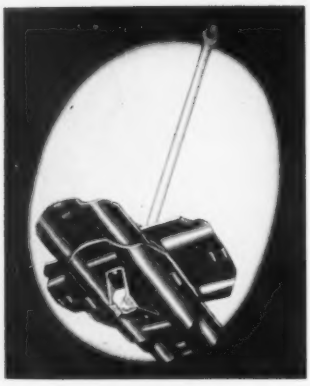

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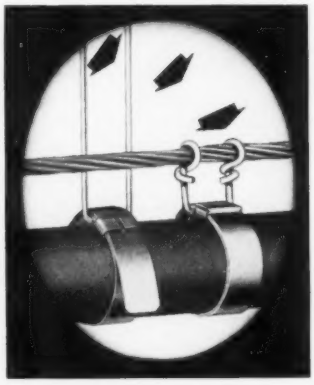

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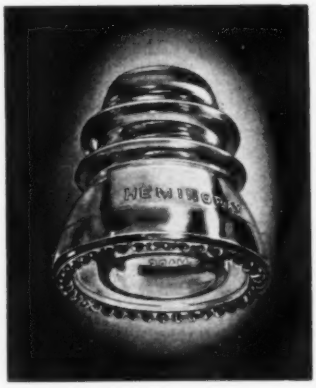

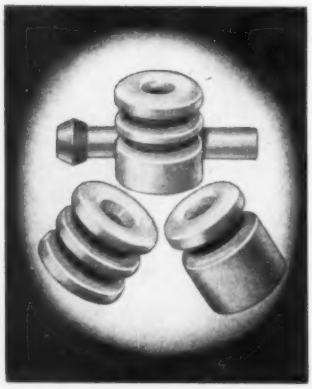

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Telephony

August 23, 1941

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XUM

Approved MAINTENANCE PRACTICES

By DANIEL SEITZ
Cable Superintendent
York (Pa.) Telephone & Telegraph Co.

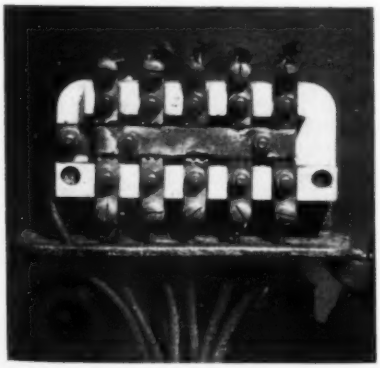
Part V. The author discusses the importance of proper protection to telephone equipment from damage caused by lightning in this installment of his popular series on maintenance. (Part IV was published in the August 2 issue.)

DANIEL SEITZ

LINE protectors should always be located with regard to the availability of good grounding conditions rather than regular spacing along the line. The selection of locations in a marsh or near a stream, for instance, will provide better ground connections than it is possible to obtain in shale or rock.

Although it is realized that in some locations it is extremely difficult to provide good grounds we should also remember that this is exactly where lightning usually causes the greatest damage. This fact challenges us to use all possible precautions to prevent serious lightning damage.

The close-up view in an accompanying photograph of a 10-wire protector after several years' service indicates the effects of having dissipated many unusually heavy lightning discharges, which indicates clearly that the protector did its work well. It will be noted that some of the teeth are burned off and that two of the elements are completely smooth. The carbon center strip also indicates the effects of the heavy lightning discharges.



Close-up view of a ten-wire protector after several years' service.

This type protector permits easy replacement of parts and as a preventive measure it is recommended that a routine inspection of protection equipment be made before the start of the lightning season each year. Replacement of protector parts is cheap as compared with cable pairs and equipment.

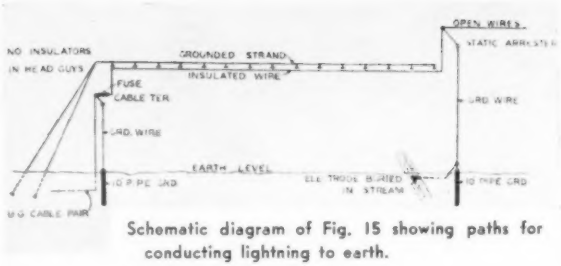
When replacing protector parts, make sure that all bolts and nuts are tightly drawn. Do not discard lock washers as they are necessary to prevent loosening caused by vibration which is always present on poles supporting open wire. Most important of all is to maintain the specified adjustment of clearances between the elements of the protector when replacing parts. Manufacturers' recommendations as to clearance should be observed and a gauge used for measuring the discharge gap.

Static type line protectors equipped with various kinds of discharge blocks are preferred by some companies. Protectors using discharger blocks are more economical to maintain due to low labor costs of replacing defective dischargers. However, we do not intend to recommend any make or type of equipment. Our hope is that you will use the protectors you now have, intelligently and to the best advantage.

Open wire lines always present a serious lightning hazard at the point where they connect to the cable. A method of providing paths to ground for dissipating these lightning charges before they have a chance to reach even the protected cable terminal is shown in *Fig. 14*.

The open wire deadends on pole "A" and bridle wire is placed in metal rings on the messenger strand to the terminal pole. The strand from the insulator near the terminal pole to pole "A" is grounded by a suitable rod located at pole "A." Also, a head guy is connected to the strand at this point to obtain additional grounding.

The insulator in the strand is for the purpose of keeping the cable and its supporting strand clear of ground, the reason for which will be explained later. Each metal ring used to support the bridle wire along the grounded strand provides a path for the dissipation of lightning. Due to the fact that it was impossible to obtain permission to trim the tree shown, wood guards were used to protect the bridle wire at this point. The life of the wood guard will be about equal to that of the wire and both may be replaced at one time.



Schematic diagram of Fig. 15 showing paths for conducting lightning to earth.

The protection of the underground cable is considered in *Fig. 15*. In this case, two spans of insulated wire are supported by cable rings on the messenger strand to connect the open wire to the cable terminal. Protecting an underground cable from lightning is even more important than an aerial cable due to the difficulty of making repairs.

Underground repairs generally require replacing a part of the cable unless the trouble occurs in the riser portion on the pole. When spare underground ducts are not available, the job will prove difficult and it is often necessary to place a number of lines out of service while replacing the damaged cable. This expense and trouble may be avoided if the lightning can be prevented from passing the cable protector.

A close-up of pole "A" in *Fig. 15* is shown in *Fig. 16*. Two types of protectors are used as may be seen mounted on the top and bottom crossarms. Your attention is directed to the grounding arrangement used on this installation. A heavy ground wire extends from each protector, down the pole and is protected by wood moulding.

The ground wires are soldered to a 10-foot ground rod at the base of the pole which is driven its full length. A trench shown by the white line in the picture was dug from the base of the pole to the stream and several strands of wire placed in it and connected to an electrode buried in the bed of the stream. These wires are also soldered to the ground wires from the protectors.

Installing the ground wire and rod in this manner will guard against damage from traffic on the highway or by farm machinery from the field nearby. Unfortunately, all locations do not afford the opportunity of obtaining a good ground so easily although a solution may generally be found as we shall attempt to explain later.

The schematic diagram of *Fig. 15* indicates more clearly the various paths for dissipating the lightning charges before they reach the underground cable. The point where the insulated wire connects to the open line wire of the protector is also connected and the ground wire extends down the pole to a rod and a plate in the stream as described in the foregoing.

Fig. 16. A close-up view of pole "A" as shown in Fig. 15.

It will be noted that the bridle wire is supported by cable rings attached to a messenger strand which, in turn, is grounded by the two head guys. Each ring provides a path to ground for dissipating the lightning charge.

In the cable terminal, a fuse protects the cable from damage by possible contact of the open wire with lines carrying high potentials. The discharge blocks in the cable terminal are connected to a ground rod. The ground rods here are ten feet in length although a shorted length may prove adequate in some locations. The length of a rod does not always determine the value of a ground connection as actual resistance measurements will often prove.

The protectors mounted on the crossarm and at the cable terminal are the first and last line of defense against lightning damage to the cable. Due to the importance of these protectors they should be maintained in the best possible repair through careful and systematic maintenance.

We shall next make a few suggestions as to how ground connections

(Please turn to page 31)

Fig. 14. One method of providing paths to ground for dissipating lightning charges before they reach cable terminal.

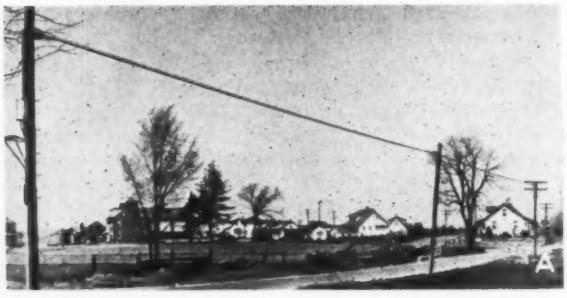
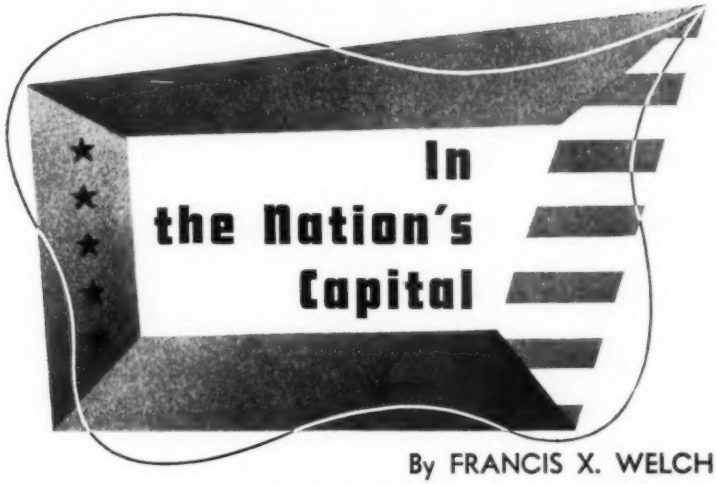


Fig. 15. Method of protecting underground cable.



By FRANCIS X. WELCH
Washington Correspondent for TELEPHONY

Much uncertainty lies just ahead for telephone companies . . . There is much "fiddling around" on the price control situation, with inflation looming nearer . . . Steps taken to "reconciliate" OPM and OPACS . . . Late figures on rural telephones . . . Federal regulation versus state again comes in for discussion.

IT LOOKS like a difficult winter ahead for the telephone companies, especially the smaller ones. Reason: rising taxes, rising wages, rising prices of materials—not to mention difficulties due to shortages in both labor and materials.

Right now the goose hangs high. There's no denying that. More connected stations than ever before in history. Earnings have jumped with the defense activity, even though the tax collector has jumped somewhat faster. But the point has been reached on the industry's economic highway where little signs are beginning to appear to the effect that the end of the smooth boulevard is just a little piece ahead. After that the going is liable to be tough.

By way of corroboration, consider the following couple of paragraphs from the current (August 13) issue of *Standard & Poor's* industrial survey of the "Telephone and Telegraph":

"The effects of the war have been highly beneficial to the telephone industry thus far, carrying earnings up to the highest levels witnessed since the depression. However, with its relatively liberal return on net plant, the industry generally is vulnerable to mounting Federal taxes, and from here out, earnings are unlikely to show any improvement.

"Except as it may accelerate the rise in tax rates, actual entry of the United States into the war is unlikely to change the outlook for the telephone industry to any great extent. Unlike the situation in the last war, when the government took over control of the telephone and telegraph industries and paid existing dividends and interest on their securities, it is the opinion of the industry and of Washington observers that private management will not again be disturbed."

As the foregoing passage suggests, it could be a whole lot worse. The black shadow of government ownership does not, however, hover over the telephone business as it does over the electric power utilities and the railroads. The situation ahead is simply uncertain and forbidding; hardly desperate, *Standard & Poor's* survey continues:

"Thus, except for the tax problem, common to all industries, the telephone companies appear to be faced with no great threat even if actual war materializes. On the contrary, war participation might tighten controls on commodity prices, and this would work to the benefit of the telephone industry which, with its fixed rates and huge payrolls (consuming some 45 per cent of gross revenue) would suffer from runaway commodity prices and wages."

Right here is where your correspondent must part company with the forecasting of these well-known financial analysts. It is because he is not so sure that, for all the argument that is going on here in Washington, the price control legislation will be enacted soon enough or strong enough to keep the bitter bite of inflation from nipping quite a few properties this winter.

Leon Henderson, the New Deal price expert himself, is quite dubious about the matter. In a radio debate last January, Mr. Henderson said, "We are not threatened with inflation at the present time." He added that we could "well afford not to be inflation-conscious." He thought he could handle price rises by "selective" action. He thought that the earlier proposals of the Federal Reserve Board, designed to head off inflation, should be the subject for "long and careful discussion."

But now Mr. Henderson is singing a different song. Early this month he told the House Ways and Means Committee considering the administration's price control bill, that the nation "stands on the brink of inflation." He pulled out a number of charts to prove this to a committee, most of whose members did not have to be shown. They all knew well enough that prices are rising.

The trouble is Mr. Henderson still doesn't believe in going all the way and asking for a universal ceiling on prices and wages. It has taken him this much time to concede that we are faced with inflation; and that the situation cannot be dealt with

"selectively," (as he had been trying to deal with it these many months). Yet Mr. Henderson still fiddles around with half remedies. He wants authority to put price ceilings on the prices of commodities and rents, but not of wages. He seems willing to concede exemptions in the application of price control to certain pet crops of the agricultural bloc.

Now it is doubtful if this sort of program, which is as full of holes as a mailman's sock, is going to give the utilities the assistance that they may well need this winter. Granted that *any* kind of price control will be a godsend for businesses such as the utilities, which can't raise their own prices to suit themselves and still must pay out more for wages and materials, the situation would still be helped tremendously by plugging the obvious gaps in the administration's bill, brought about by the logrolling opposition of the farm-labor coalition.

* * *

Some readers of this department have expressed the opinion, in letters, that your correspondent is perhaps too alarmed about rising prices, wages, taxes, etc. This writer received letters six months ago from readers who thought he was getting too excited about priorities and material shortages. Now look at the situation! Well, it is going to be equally tough in the price field if the people on the business side of the fence fail to aid the administration in obtaining the ceiling price control bill as soon as possible. Wages in defense industries are going up every day.

The telephone companies' registration lists of those seeking employment (both male and female) have gone down to a fraction of their former size and in some cases have disappeared altogether. Telephone company advertisements for long-distance and local switchboard operators have begun to appear in the newspapers.

By next winter it will be pretty hard for some companies operating in the shadow of defense industries which are tempting male and female help with flattering wages. The draft extension, keeping younger men in service, while tapping the new crop for more selectees, won't be a bit of help in this situation. A wage ceiling clamped down by Congress would give the telephone companies and other regulated industries at least a fighting chance to compete with defense boom activities.

The price of raw materials has so far stayed down pretty well thanks to the stout efforts of Mr. Henderson. But if Mr. Henderson should ever let go of that questionable and rapidly-fraying leash he now has on the commodities, they would be out of sight in no time. Of course, nothing can be done about rising taxes. The most that can be said of it is that it will shield the telephone industry from further rate reductions, which might be disastrous once general business activity returns to more normal levels.

Congress has knocked off work for a month. So far, the price control bill has not even gotten out of committee. This means that it will be well into October before we can expect any legislation, even assuming that Congress will work on the measure at top speed when it returns.

There is a chance that during the interim the present price situation will become so dangerous that it will wake up Congress to the gravity of its responsibility. That might dissolve some of the logrolling opposition. If so, a better bill than that now before the House committee may be passed. In any event the telephone people in their own interest would be well advised to let their Congressmen know. Sound and prompt price and wage control legislation might mean the difference between bankruptcies and survival for some small companies next winter.

* * *

One chore which President Roosevelt left behind him when he went out to sea to meet Prime Minister Churchill was the settling of the increasing differences between OPM and OPACS. He gave this job over to his friend of long standing, Judge Samuel I. Rosenman of the New York Supreme Court. And the latest word is that Judge Rosenman thinks he has the problem pretty well licked.

This is still unofficial. But according to the Washington grapevine, the plan Judge Rosenman has worked out would call for a board (probably of seven members) that would decide questions of policy in OPM operations. It would also decide issues of authority between the two groups, OPM and OPACS. Both OPM and OPACS will be represented on the board, together with defense cabinet departments (War and Navy). Heading the board will be some big-shot New Dealer, such as Vice President Wallace. This is supposed to put an end to the embarrassing collisions which have occurred between Messrs. Knudsen, Hillman, and Stettinius on one side, and the Henderson agency on the other.

* * *

During the last census, the census department undertook to count the number of farms served by electricity. Coincidental with this rural electrification survey, the census bureau decided that, while it was about it, a rural telephone survey wouldn't be much extra trouble. So a census of rural telephones was

LETTER FROM A READER

Telephony Publishing Corp.,
608 S. Dearborn St.,
Chicago, Ill.

Dear Sirs:

In your recent issue of TELEPHONY of May 24 there was an article, "Approved Maintenance Practices," Part I, by Daniel Seitz, which was written in a manner clear to anyone who would read the article—whether a telephone expert or the average layman.

Upon receipt of the May 31 issue of TELEPHONY I looked for a continuation of the maintenance article but found none.

This series of articles will be very helpful and I had planned on using them in an instruction course, due to the easy style, usage and manner in which Mr. Seitz has presented this technical subject. I would appreciate knowing when Mr. Seitz is going to continue the articles.

Your magazine is certainly a comprehensive one on the subject of telephony, and I enjoy reading every issue.

Yours very truly,
DON C. BENJAMIN

taken—along with the rural electrification count.

The bureau is still putting out the results, state by state. Hence a complete list of states is not yet available. But enough of them have been released to give us a pretty good picture of the relative proportion of farms having telephone service in various sections of the country. The partial list appears in the accompanying table.

* * *

The state utility commissioners who are about to assemble for their annual national convention in St. Paul next week will be more than interested in the contents of a memorandum left behind by Harry R. Booth when he recently shifted from FCC to OPACS. It will also interest telephone companies. The memorandum is addressed to Commissioners Walker, Wakefield, and the FCC telephone rate committee. It is entitled "Proposed Amendment to the Communications Act."

The significance of this memorandum lies not so much in the probability that the ideas of regulation advanced therein will be adopted in the near or far future. It lies in the revelation of what some of the regulatory reformers in Washington are thinking about. Specifically, it reveals an accelerated trend away from state regulation towards centralized Federal regulation.

Mr. Booth obviously has small regard for the effectiveness of state regulation. He doesn't blame the deficiency (as he sees it) on the state commissioners personally; but rather upon the peculiar nature of the problem of telephone regulation and the legal and financial limitations of state regulation. In a word, if Mr. Booth's ideas were put into practice, state regulation would probably be reduced to a hollow shell—just about as extensive as the state commissions' authority over the railroads today.

Following the same example, the jurisdiction of the FCC over the telephone companies would become about as predominant as the present jurisdiction of the ICC over the railroads. The FCC would regulate everything—long distance, local exchange—perhaps right down to the cross-road Independent.

In outlining his position, Booth mentions five factors which he thinks should be considered in determining what changes to make in the act:

(1) The telephone provisions of the present Communications Act are inadequate and were simply cribbed from the old Interstate Commerce Act. Obviously, Congress did not have enough information in 1934 to write a modern, effective regulatory statute for telephone regulation.

(2) Telephone regulation is essentially a national problem, due to the predominant position of the Bell organization which transcends state lines, not only with respect to its centralized affiliates, but also some of its operating subsidiaries. Under such circumstances, state regulation is extremely difficult, involving as it does the segregation of local plant and expenses from interstate service, and the determination of proper financial relations between the operating subsidiary and its corporate affiliates.

(3) Despite its presently limited authority and short period of existence, the FCC has done remarkable work in bringing about interstate telephone rate reductions—reductions amounting to nearly $45,000,000 annually. It has also accumulated much valuable information during its investigation of the Bell System and has established a

(Please turn to page 30)

PROPORTION OF OCCUPIED FARMS IN U. S. HAVING TELEPHONE SERVICE

State	*Total No. Farms*	*Telephone on Farm*	
		No.	*Pct.*
Alabama	231,801		
Arizona	18,468	2,670	14.5
Arkansas	216,674		
California	132,659		
Colorado	51,436	16,795	32.7
Connecticut	21,163	13,066	61.7
Delaware	8,994	2,216	24.6
Florida	62,245		
Georgia	216,033	8,473	3.9
Idaho	43,663		
Illinois	213,439	105,683	49.5
Indiana	184,549	83,675	45.3
Iowa	213,318	142,091	66.6
Kansas	156,327	79,666	51.0
Kentucky	252,894	39,851	15.8
Louisiana	150,007		
Maine	38,980	17,105	43.9
Maryland	42,110	12,982	30.8
Massachusetts	31,897	17,066	53.5
Michigan	187,589	52,025	27.7
Minnesota	197,351	87,939	44.6
Mississippi	291,092		
Missouri	256,100	99,799	39.0
Montana	41,823	6,966	16.7
Nebraska	121,062	52,349	43.2
Nevada	3,573	1,201	33.6
New Hampshire	16,554	8,528	51.5
New Jersey	25,835	9,359	36.2
New Mexico	34,105	2,287	6.7
New York	153,238	59,526	38.8
North Carolina	278,276	12,111	4.4
North Dakota	73,897	20,627	27.9
Ohio	233,783	88,888	38.0
Oklahoma	179,687		
Oregon	61,829	20,950	33.9
Pennsylvania	169,027	54,472	32.2
Rhode Island	3,014	1,502	49.8
South Carolina	137,558		
South Dakota	72,454		
Tennessee	247,617	32,468	13.1
Texas	418,002		
Utah	25,411		
Vermont	23,582	4,998	19.7
Virginia	174,887	11,052	46.9
Washington	81,686		
West Virginia	99,282	26,161	32.0
Wisconsin	186,735	20,308	20.5
Wyoming	15,018	72,436	38.8

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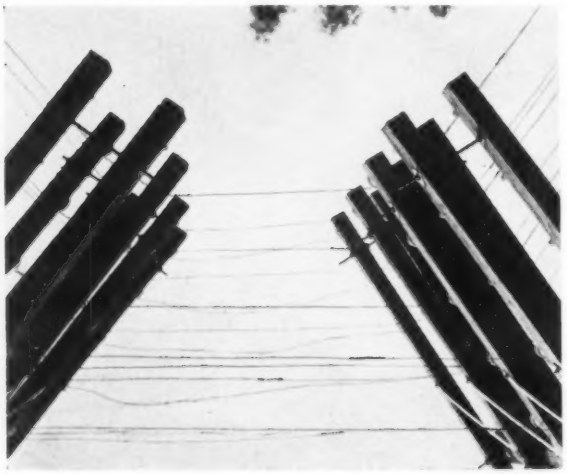
The Plant Man's Notebook

By RAY BLAIN
Technical Editor

A TRUE yet peculiar fact is that even though good splicing sleeves of the compression type have been available for several years, large numbers of defective wire splices are still in service. The other day while looking for something to photograph, we noted a number of bad-looking splices on an otherwise fine four-crossarm open wire lead. The accompanying photograph, taken of a two-pole corner, will prove this statement. Note the several two-wire served splices which have a corroded appearance and which are, without a doubt, defective.



Note defective splices in an otherwise good telephone line.

The twisted sleeve joints are likewise bad. A compression tool and sleeves, plus a few minutes' work, would accomplish wonders with this line, but in all probability it will go on for years giving an inferior grade of service through these defective high resistance splices.

* * *

It seems strange that so many telephone companies neglect to utilize gas testing of cables. These tests insure a new splice being good. One bad splice will often cost more than the first cost of several testing outfits. Many seem to be under the impression that gas testing is expensive and that wax dams and other complicated measures are necessary.

This is not the case because in order to meet average testing requirements, one merely taps the lead sleeve, connects the gas, turns a valve and builds up the pressure until a proper reading is obtained on a gauge. The splice is then covered with a soapy lather, and if bubbles form, leaks are indicated. This method is known as flash testing and will prove very effective.

* * *

Containers for carrying drinking water on construction trucks cost very little and prove desirable in various ways. Considerable time is saved as men can drink frequently and conveniently. Also, a supply of pure drinking water is assured. Sickness is frequently caused by men drinking from contaminated wells and roadside streams.

* * *

Trouble caused by the raveling and tearing of friction tape along the edges is often experienced. The representative of a textile manufacturer informs us that this fault could easily be corrected by a bias weave which would increase the cost of tape very little.

* * *

WALTER HASSELHORN, Chicago, president, Cook Electric Co., paid us a hurried visit while he stopped off in Washington between planes on defense matters. Business men these days are certainly making use of telephone and airline services.

* * *

Lt. Col. FOSTER L. STANLEY, Indianapolis, Ind., plant extension engineer, Indiana Bell Telephone Co., was placed on active duty in the plant and traffic division, Office of the Chief Signal Officer of the Army, Washington, D. C., on August 4.

SERVICE: "If forty years in the telephone business have taught me anything it is that in order to keep subscribers happy and paying, you must give them service," writes Lee C. Sprague, superintendent of the Southeast Arkansas Telephone & Power Co. "Our old magneto switchboards are outmoded and even in a backwoods

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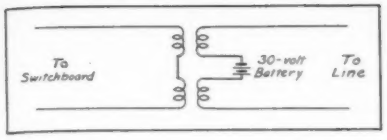

An arrangement of connecting a repeating coil in a local battery line to provide common battery service.

community many demand common battery service. Telephone companies, especially the smaller ones, are usually notoriously poor and have little money to spend for modernization.

"To furnish common battery service with a magneto switchboard, I use a 30-volt storage battery which consists of five six-volt automobile batteries in series. I connect a ring-through repeating coil to each subscriber's line as indicated in the drawing. I also constructed a battery charger from an old radio B-battery eliminator which I keep connected at all times.

"When a subscriber removes his receiver the current flows over the circuit and gives a double kick through the repeating coil which throws the ring-down drop on the switchboard. I now have about 20 telephones working in this manner and receive a bonus of 50 cents extra on each per month for the special service.

"When a line is short-circuited you do not get a permanent signal, but a 'can't get central' report. There is no current flowing on the line except when a receiver is off the hook or the line short circuited. A loop resistance of about 600 ohms is maximum with this arrangement. The line must be metallic and all connections good for otherwise the noise will be terrible."

▼ ▼

London Telephone Crews Applauded

Expert American observers in England recently applauded the alertness of the telephone workers in London in being able to produce excellent work speedily and under pressure.

In one telephone switchboard building, for instance, 70,000 cable pairs on the main frame were put in order within two weeks—notwithstanding the fact that it was necessary to get at them through debris, sewage, water and gas fumes, and that the crews, in muck up to their necks, had to wear gas masks most of the time. Dispersal of facilities, rather than dependence on central stations, is the lesson for New York and other large cities, the experts say.

When telephone exchanges are put out of action, a special telephone bureau is established in a room where important business can be transacted temporarily. In this field of communication, the American observers report, repair crews have developed extraordinary and heroic efficiency.

TELEPHONE MEN "CALLED TO THE COLORS"

HAROLD CHAMBERS, wire chief at Taylorville, Ill., for the Illinois Consolidated Telephone Co., has been called into military service.

* * *

T. O. CAGLE, formerly manager at Flora, Ill., for the Illinois Commercial Telephone Co., is now in military training.

* * *

AUBREY WOOLFORD, formerly manager of the Kingsport, Tenn., exchange of the Inter-Mountain Telephone Co., reported for military duty in May at Fort George Mead as a first lieutenant in the 64th Signal Corps Battalion. He was called to the army from his status as a reserve officer, a rank he gained as a student at Virginia Polytechnic Institute. He is married and has two children.

* * *

ROBERT EDGREN, employed in the commercial department of the Des Plaines, Ill., exchange of the Middle States Telephone Co., left June 20, for military training.

* * *

NORMAN G. EKBLAD, combination man at the Cooperstown, N. D., telephone exchange, was drafted into army service on July 8.

* * *

DELMAR H. WOHL, a member of the plant staff of the Illinois Valley Telephone Co., at Streator, Ill., was inducted into military service on June 28 and has been assigned as a private to Battery B, 51st Artillery Training Battalion at Camp Callan, Calif. Mr. Wohl had been working as a switchman in the Streator automatic exchange and anticipated being assigned to Signal Corps work with the coast artillery.

* * *

DONALD V. JUDKINS, formerly employed in the northern division equipment maintenance department of the Tri-County Telephone Co., South Haven, Mich., was inducted into army service at Detroit, June 3. He was sent to Fort Custer and from there was assigned to Company B, 52nd Training Battalion, Camp Walters, Texas. He had been with the telephone company since September 1, 1939.

* * *

DONALD DAHLQUIST, formerly employed by the Central Electric & Telephone Co., at the Slayton, Minn., exchange, is in the army stationed at Camp Claiborne, La. The first of June he was transferred from the engineering division to the Signal Corps at his request.

▼ ▼

"National Emergency" Causes Telephone Increase

In the local exchange of the Lexington (Ky.) Telephone Co., more than 200 girls, operating 80 switchboard positions, are now handling approximately 125,000 local and from 1,800 to 1,900 long distance calls daily.

Telephone traffic has been increasing since the beginning of the national emergency, particularly in long distance calls. With about a million and one-half young men in our armed forces long-haul toll calls have increased.

The organization is rapidly increasing its plant facilities, both in its central offices and in its local and toll lines, in order to meet the rapidly expanding defense telephone requirements, and to provide for the needs of every individual user.

Almost 650 rural telephones were changed from magneto to common battery service with the delivery of the Lexington telephone directory in the spring.

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The Operator's Corner

By MAYME WORKMAN
Traffic Supervisor
The Illinois Telephone Association

THE ORDER of the day in the traffic department is: Training, training and more training. With the volume of business increasing rapidly—in some cases breaking all previous office records in the number of calls handled per day—and the upward trend in force turnover, chief operators are faced with the perplexing problem of training people fast enough to replace their losses.

The following excerpt from a letter received from a chief operator in a typical Illinois exchange is an example of the present-day traffic employment problem:

"We are having heavy loads on toll, and local as well, and our office has been so busy we are installing a new trunk as soon as we can get the equipment. We are planning on improving our rural traffic situation, too, but that depends upon getting the necessary equipment.

"We are having our usual vacation turn-over and then some. Miss (Blank) left for California Monday and took another operator with her; on August 1, I am losing an operator who is accepting a position with another business establishment in our community; on August 15, an operator is leaving to be married and is going to another state to live; on September 30, an operator is resigning to attend a university and another has requested a release to go to work in a larger exchange in a nearby town. Then, to top it all off, one of my operators on vacation, who was scheduled to return to work Monday, just called and said she has the mumps on both sides. Can you beat that?"

Well, I think we all agree this chief operator is having her troubles and some may be of the opinion this is an unusual case. Not at all. On the contrary, it is typical of conditions in many Illinois central offices. The problems may vary. For example, in exchanges located in communities where the government is employing large groups of women, there is the problem of securing desirable applicants for telephone work. Very small exchanges, of the contract type, are losing employes too.

What are we going to do about it? Just what we have always done. Put our shoulder to the wheel and work out a solution to our problems.

Chief operators who worked during the World War are familiar with many of the present difficulties having experienced them before. They know, too, that there is no problem beyond solution. They are aware of the task which lies ahead, the work of training new people and trying to keep service up to standard, with the average operator's experience factor dropping lower and lower from month to month.

Best Story of the Week —What's Yours?

A Minneapolis, Minn., man talked to his girl friend too long one night recently. He called her from a drugstore about 11:30 p. m. to ask her for a date the next day. The conversation lasted 25 minutes. When he emerged from the booth he found the store had been locked up. He was alone, the front door was barred and there was no other means of egress. Having no available slug, he could not telephone for aid.

What to do? If he created a commotion some passerby would call the police and they might come a-shooting. He didn't want to get shot up, so he had to stay in the store all night.

Speaking of the work to be done in operators' training, initial training and toll training as well, as an illustration, an exchange which trained on an average of one or two operators a year is now training about 40 operators during the same period.

During the so-called depression, with the highest average operator experience ever known in the history of the telephone business, chief operators were practically relieved of employment problems and operators' training; yes, even service problems to a certain extent. The quality of the telephone service rendered reached an all-time high. Today, conditions have and are changing rapidly. It's full steam ahead. Hard work and many problems but there is pleasure and satisfaction, too, in meeting and overcoming all obstacles.

Questions from Illinois Operators

1. May a collect call charged to a third number be handled by a tributary operator or should the call be handled by the toll center?
2. When the information operator says the number is "424, if DA call 425," which is entered in the "Special Instruction" space?
3. Can a tributary wait on a BY at her toll center?
4. When do you give the charge and the rate on a call?
5. Should the operator collect a report charge as well as a message charge when a subscriber places a station-to-station call and it is completed after receiving a chargeable report on a person-to-person call?

The answers to these traffic questions are presented on page 30.

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Such approval is actually the result of long years of painstaking design — and of Automatic Electric's pioneering in the use of molded plastics in telephone construction. The smoothly rounded contours of today's Monophone — its lustrous finish, non-chipping and undimmed by age — all stem from this company's early utilization of this modern material and the perfection of its own molded plastic processes.

Telephone companies are finding the advantages of investing in Monophone beauty are very real and very tangible — not only for better public relations, but also because this beauty is the result of basically sound construction which brings with it durability, strength and long life. For your own exchange, insure a lasting investment in beauty plus brawn, by specifying only Monophones when either replacement or expansion make new purchases advisable.

The Type 40 Self-Contained Desk Monophone, equipped with dial for automatic operation.

The Type 50 Wall Mounting Monophone, provided with number plate for manual service.

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By F. L. SPANGLER, M. E.

WIRE ROPE FOR CABLE PULLING

Various methods of construction discussed, with suggestions as to how to get maximum life from wire rope. Preformed rope recommended for ruggedness and safety.

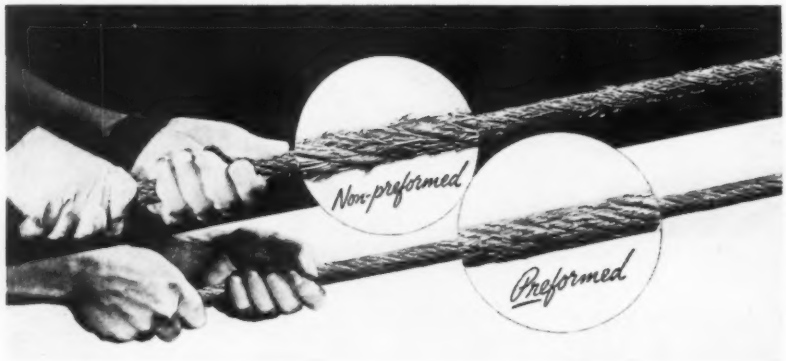
THE PROBLEM of selecting wire rope for cable pulling and other field jobs has two main aspects; one is economic, the other has to do with personal safety. Naturally, one desires to get the greatest possible service out of each dollar of rope investment. It is desirable, therefore, to select rope that will give longest life under the conditions of service. Also, due consideration should be given to the problem of eliminating hazards to men handling the rope caused by the jagged ends of broken wires sticking out.

Wire rope is supplied in many types, constructions, and materials, resulting in several hundred different combinations, each designed for one or more specific applications. Of these, about 30 are in common use, the others being somewhat special.

Some of the differences between these ropes are readily detected by the eye, such as the number of strands, the number and arrangement of wires in the strand, the type of rope center (whether hemp or wire), and the type of lay (whether right or left lay, and regular or Lang lay).

Also, if the wires and strands at the end of the rope tend to separate and unlay so they must be held in position by seizings consisting of wraps or soft wire, the user knows that the rope is non-preformed; but if the strands and wires stay in position without being restrained, the rope is preformed. Whether the wires are made of improved plow steel, ordinary plow steel, cast steel, or other grade of steel cannot be determined merely by inspection.

If the wrong choice of construction, grade, or type is made, the rope will not give the best service. In addition, it may present a hazard to men who handle it. To attain the aim of economical rope service and safe operation, those responsible for the selection of rope should have an understanding of those factors that affect rope service and how these factors are controlled by the manufacture and design of the rope.



Views of non-preformed and preformed ropes after operation over small sheaves, which cause fatigue breaks in the crown wires. The broken wire ends hug the preformed rope, but they stick out from the non-preformed rope forming jagged barbs that often puncture or lacerate the hands of men handling the rope.

This discussion will not consider standing ropes, such as guys, since these are virtually standardized as to construction and, their life being long, the annual replacement cost is relatively small.

With working ropes—that is, ropes operating over drums or sheaves—such factors as metallic fatigue, abrasion, and corrosion will, if present, reduce the life of the rope, often resulting in frequent rope replacement and high rope cost. The selection of working ropes, therefore, deserves special consideration.

In such work as cable pulling, where breaking of the rope would not result in a hazard to men or property, the rope may be operated until it parts in two, though it is usual to inspect the rope at intervals, and when the number of broken wires reveals a greatly weakened condition the rope is replaced before it is used on the next heavy job.

When a rope breaks on a job it may force the crew to be idle until the old rope has been removed and a new rope installed, and, in cable pulling, delay may be caused in retrieving the end of the rope attached to the cable or load.

An experienced operator knows by the feel of the winch how much load he is putting on the cable, and he will stop short of an actual breakage. It must be remembered, however, that the strength of a rope is reduced by broken wires and by reduction of wire sections caused by abrasion or corrosion. A rope so weakened may break under a load that would safely be handled by a new rope. The usual method of determining the condition of the rope

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She helped catch a burglar... as part of the night's work

A DARK, DISMAL November night at the switchboard. A succession of routine calls. Then suddenly a woman's voice, low and terrified, "You've got to help me, operator, there's a burglar trying to break in our house." The voice faltered. "My husband's away!"

The operator wasted not a second. Ringing the nearest state police station, she quickly gave explicit information . . . then reassured the woman. Rushing to a lonely house in the country, the police were in time to capture the burglar before harm was done.

Quick response in emergencies, unfailing courtesy and reliability are qualities on which the telephone tradition is built. And this great service demands dependability in equipment as well as people . . . one reason why Exide Batteries have contributed to telephone progress ever since 1895.

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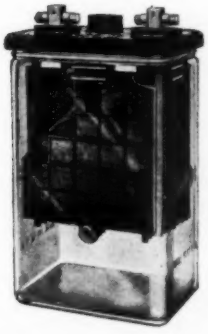

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is by an inspection of the crown, or outside wires.

The strength of a rope is determined by its nominal diameter, its construction, the grade of steel of which it is made, and the type of center. The handbooks of wire-rope manufacturers give the ultimate strengths of ropes for all combinations of these variables. The most important factor in rope strength is the diameter. Knowing the maximum load, and assuming a desirable factor of safety, the diameter required can be determined for any grade of steel rope.

The most popular construction for working ropes is 6x19—that is, a rope of six strands of 19 wires each. This rope is made in three common constructions—filler wire, Warrington, and Seale, the difference between these being illustrated in the accompanying diagrams.

One of the largest telephone companies in the country employs $\frac{3}{8}$-in. rope of improved plow steel grade and 7/16-in. rope of mild plow steel grade for cable pulling and other field work. Both ropes have hemp centers. The former has a breaking strength of 12,600 lbs. The latter, being of greater diameter, though made of lower-strength steel, has a breaking strength of 13,200 lbs.

Naturally, a given size of drum will hold a smaller footage of the 7/16-in. rope than of the $\frac{3}{8}$-in. rope. The length of 7/16-in. rope that can be reeved on the two standard drum sizes is as follows:

Drum Dimensions

Length	Diameter	Flange Diameter	Length of $\frac{7}{16}$" Rope	Ratio of Drum Dia. to Rope Dia.
3′	8″	16″	100′	18.3
12′	8″	19″	890′	18.3

This rope is 6 by 19—that is, it has six strands of 19 wires each, and is of Seale construction, with hemp center. With rope of this construction, a ratio of sheave diameter to rope diameter less than 20 produces a construction of the wires and strands that prevents these parts from adjusting themselves relative to one another as the rope flexes. As a result, excessively high stresses are set up in the wires of the rope, thus contributing to fatigue of the metal.

Since the sheave diameter ratio obtained with these drums is 18.3, which is less than the critical ratio, flexing and unflexing of the rope onto the drum will quickly produce fatigue breaks in the wires. When all, or almost all, the rope is spooled onto the drum, the rope in the outside layers will not show such great evidence of fatigue, since the effective spool diameter here is greater than in the case of the bottom layers.

However, the first layers will be spooled off and onto the drum every time the rope is used, while the rope in the bottom layers will work off and back onto the drum only on those jobs where nearly or all the length of rope is required. Hence, the flexing and unflexing of the top layers will be more frequent than the bottom layers, thereby increasing the fatigue action and tending to balance the reduction in fatigue brought about by the smaller bending stresses.

The circumstances of use will determine whether one end of the rope will show more evidence of fatigue than the other end, and if such is the case the life of the rope can be extended somewhat by changing end for end before the number of fatigue breaks in the wires requires that the rope be discarded.

In placing or pulling poles rope-end wear is common, and rope life is increased by frequent cropping of the worn ends.

Fatigue can be reduced by using preformed rope and also by using rope of more flexible construction. In preformed rope, the strands and wires are preformed to their exact helical shape before the strands are closed onto the rope center in the final manufacturing operation. Hence, they lie in a state of rest, resulting in a rope that is handled with much the same ease as a manilla rope, does not tend to twist as it works over drums and sheaves, and does not tend to loop and kink.

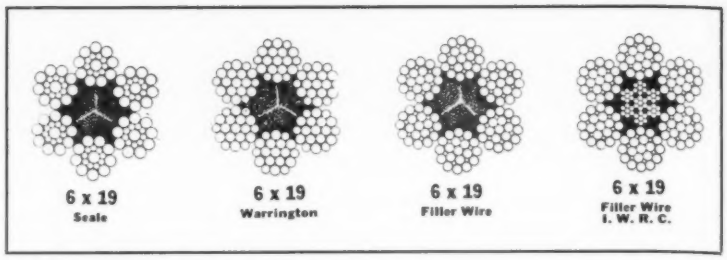
As a result, the rope lies straight and it spools straight on the drum. Such rope is relatively free of unbalanced stresses and the wires and strands adjust themselves with greater ease to the contour of drums and sheaves.

Since the total stress in preformed rope is reduced by these various factors, the rope is endowed with a high resistance to fatigue. Records of preformed rope show service lives in many cases 100 per cent to 200 per cent greater than with non-preformed rope. This explains in part why preformed rope is finding general application on winches and hoists used in telephone work, where the drum and sheave diameters are small.

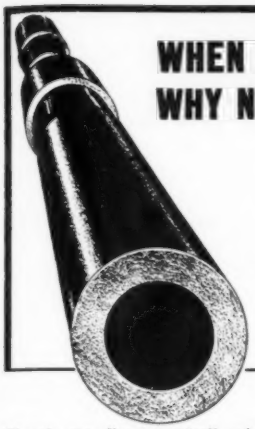
The construction of a rope has an important bearing on flexibility. The ease with which a rope bends depends on the diameter of the rope and on the size of the outside wires in the strands. Naturally, of two ropes of the same construction, the one of larger diameter will be less flexible than the smaller one. Also, the larger the wires making up the rope the less flexible will the rope be, since the greater the diameter of a wire the greater force is required to bend it in an arc of given radius.

It is also well known among many rope users that Lang lay rope is more flexible than regular lay, this being attributed to the fact that the crown wires of Lang lay rope lie at an angle of about 37 degrees with the rope axis, while those of regular lay rope are parallel with the rope axis, and therefore the Lang lay crown wires are required to absorb only an angular component of the bending stress, instead of the full bending stress as in the case of regular lay rope.

Since ropes of filler wire or Warrington construction employ smaller wires than ropes of Seale construction, the former are more flexible and are less subject to fatigue. Likewise, eight-strand rope is more flexible than six-strand rope. Lang lay rope also shows less tendency to fatigue, since it is more flexible than regular lay rope. The Lang lay construction, however, is not suitable for



This illustration shows the difference between the common constructions of wire rope.



WHEN YOU BUY CONDUIT WHY NOT GET ALL

1 *Cable protection*
2 *Permanence*
3 *Strength*
4 *Economy-Plus*

There's no "compromise" when you buy Orangeburg NOCRETE, for no other conduit can offer all its advantages at its low cost.

First, NOCRETE provides *complete* cable protection — prevents cable corrosion. And this protection is practically *permanent*, for this conduit is essentially everlasting —is immune to electrolysis and soil corrosion. Of equal importance, Orangeburg NOCRETE is so strong that it requires no concrete encasement.

And—NOCRETE offers economy—*plus*. Its cost is about half that of metal pipe and less than that of non-metal pipe of comparable quality. Then—because it handles easier, assembles and installs faster than *any* other conduit, its total savings are well worth investigation.

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ORANGEBURG *Standard* for installation *with* concrete encasement.
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The new machine for locating faults on aerial telephone lines, without the necessity of climbing poles . . . also locates buried cable, water and gas pipes or wiring in the walls of buildings.

Equipment consists of: amplifying unit, exploring coil and line tapper, three 40 inch lengths of bakelite tubing, containing wiring to coil and communication lines for line tapper. Amplifier contains loud speaker.

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All over the country General Electric Copper-Oxide Battery Chargers are keeping telephone common battery systems in tip-top operating shape.

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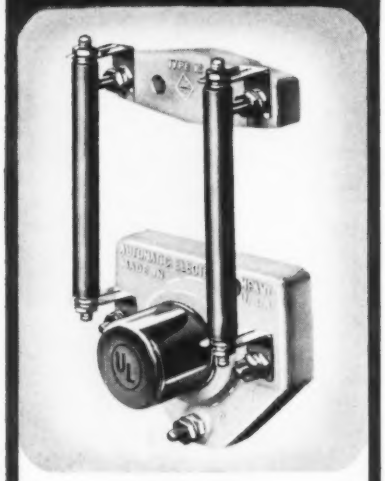

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You can get **full** protection with **lower** maintenance costs by installing the SANDS Type 12 Indoor Protector. Its 2105 Discharge Block is self grounding on heavy currents, and automatically resets itself when the current ceases. Eliminates re-setting expense, and —best of all—you're assured of constant, unfailing protection. Put Type 12 at the top of your next supply order.

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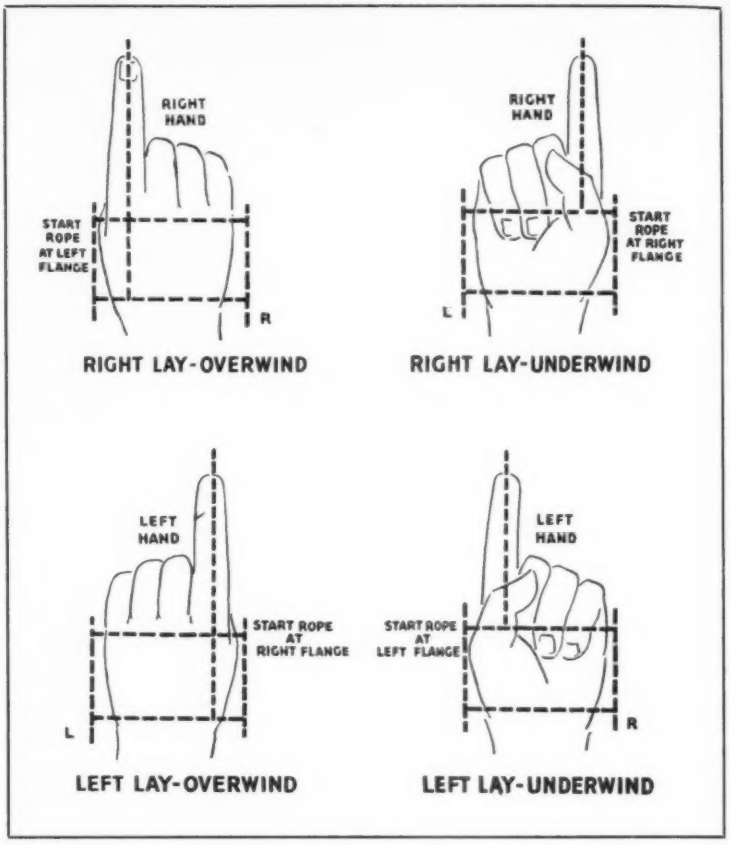

In this diagram the right and left hands are used to illustrate the overwinding and underwinding of wire rope, as described in the text.

winches unless provided with a wire rope center, since this rope has a tendency to crush when wound in more than one layer on a drum, particularly if it is loaded heavily.

Though the larger crown wires of Seale rope result in greater stiffness than obtained with ropes of filler wire or Warrington construction, these large wires have an important advantage where the rope is subjected to severe abrasion, since they will stand more abrasive wear and peening than will ropes employing smaller crown wires.

Where the rope is subjected to heavy loads and is wound in several layers on a winch or other smooth-face drum, any failure to spool evenly results in a separation between adjacent wraps, with the result that the wraps in a layer will pull down between the wraps in the layer below, resulting in a binding between ropes and severe abrasion, known as scrubbing.

Where scrubbing is an important factor in rope life, the Seale construction may be preferred despite the fact that it shows evidence of fatigue more quickly than rope constructions employing smaller wires.

Scrubbing of the rope can be reduced by promoting even spooling. Preformed rope helps to some extent because it lies straight, does not tend to twist when working over the drum, and therefore it results in more even spooling than does non-preformed rope.

Even spooling is also helped by starting the rope from the correct drum flange when spooling it onto the drum. To determine at what flange to start the rope, one can use the simple method illustrated in the accompanying diagram.

If the rope is right lay—that is, the helix formed by the strands travel in the same direction as a right-hand thread—the rule is applied by using the fist of the right hand with the index finger extended. The fist represents the drum, and the finger is the rope leading from the drum. If the rope overwinds—that is, it spools off along the top of the drum — the fist and forefinger are made to simulate this picture, which places the forefinger at the left side, and therefore the rope should lead off at the left flange.

If the rope underwinds, inspection of the fist and forefinger shows that the rope should lead off at the right flange. The proper spooling of a left lay rope is determined in the same way, except that the left fist and forefinger are used.

We now come to the element of safety in rope selection. After some use, ropes develop breaks in the crown wires, particularly if the ropes operate over small drums and sheaves. These breaks may be caused by fatigue, abrasion, or corrosion, or a combination of any of these factors.

In some ropes, these broken wire ends stick out like jagged barbs, which may puncture or lacerate the hands of those handling the rope. Puncture wounds of this type are regarded by physicians as a very dangerous kind of wound, since they are apt to be deep-seated and the injured person sometimes considers them as superficial injuries and fails to report for medical care.

It is not uncommon for men to receive a puncture wound and not be aware of it until infection starts in. One insurance company recommends that workmen, when handling rope of this kind, wear heavy gloves that will give adequate protection, and in addition wash the hands afterwards in a weak solution of an antiseptic, which will cause a burning sensation at any point where the skin has been broken and thereby locate any injury that the gloves have failed to ward off.

Some concerns experiencing injuries of this sort have changed to preformed rope to eliminate these "barbs." In every case that has come to the writer's attention where preformed rope has been used, the injuries and infections caused by the handling of rope have been greatly reduced in number and, in some cases, entirely eliminated, resulting in a considerable saving in medical and hospital fees and workmen's compensation costs.

The absence of barbs on preformed rope is attributed to the fact that the wires and strands are formed to their final position in the rope before the strands are closed onto the rope center, and therefore the helical curvature is the natural curvature of the wires. When a wire breaks, the ends separate slightly, but the wire does not fly out and attempt to assume a straight line, as broken wire ends do in non-preformed rope.

In view of the many factors entering the selection of rope for winches and hoists, it is impossible to standardize on any one size or construction of rope that will best serve all installations. Each application must be analyzed individually and the several factors weighed as to their relative importance. Careful consideration of the problem should lead to maximum service and safety from wire rope investment.

Just a Telephone Number to Him

A nostalgic trainee at the field artillery replacement training center at Fort Bragg, N. C., was relaying firing commands for 75 millimeter guns when the order came over the telephone, "Range, 4,000."

Still thinking of home, the trainee relayed a home town telephone number, "Range 8192."

Now the government is contesting a suit for three turkeys, a cow and a silo.

Photo courtesy of Associated Telephone Co., Ltd.

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Personals

R. PHILIP HART, of Cazenovia, N. Y., vice president of the Cazenovia Telephone Corp. and a director of the New York State Telephone Association, has the sympathy of his many friends in the recent death of his son, Dick, by electrocution.

Dick this spring completed his freshman year at Cornell where he rowed on the freshman crew. He was working during summer vacation, learning the telephone business, and on July 23 while on a plant job just outside Cazenovia he accidentally came in contact with a power line. Sincere sympathy is expressed to Mr. and Mrs. Hart in their loss.

•

FRANK J. BAKER, Fort Wayne, Ind., general plant superintendent of the Home Telephone & Telegraph Co., gave an address on the operation of the company and the part it plays in the progress of Fort Wayne, during a meeting of the Lakeside Northeast Association.

•

E. M. KIMBROUGH, manager of the Gulf States Telephone Co. at Athens, Texas, really did things up in a nice way when he invited the newsboys of Athens, including the carriers and their substitutes, as his guests for a picnic and outing at the Athens Fish and Game Club.

•

MAJ. GEN. JOSEPH O. MAUBORGNE, Chief Signal Officer of the U. S. Army, will retire on September 30 after a four-year term of duty in that post. General Mauborgne will make an extended tour of inspection during the month of August and will take a month's vacation during September before terminating his service.

BRIG. GEN. DAWSON OLMSTEAD, commandant of the Signal Corps School at Fort Monmouth, N. J., will serve as Acting Chief Signal Officer during the absence of General Mauborgne and until further notice.

•

On July 28 **MRS. MAYME WORKMAN,** of Springfield, traffic supervisor of the Illinois Telephone Association, visited Monmouth, Ill., and addressed the Rotary Club at noon and the Lions Club in the evening. **FRED NORRIS,** district manager for the Illinois Commercial Telephone Co. at Monmouth, was highly complimentary in his comments on Mrs. Workman's talks and expressed the opinion that his company would benefit therefrom. The Monmouth newspaper also commented very favorably, stating that her address was interesting and informative.

This is just one of Mrs. Workman's many speaking engagements before civic groups throughout the state. While traveling from place to place on telephone assignments, she aids in building good will for the local telephone company by addressing civic clubs and groups.

Her weekly article in TELEPHONY, "The Operator's Corner," is a popular feature of our magazine.

•

EDWARD M. RILEY, assistant supervisor of the Jamestown (N. Y.) Telephon Corp., has the unusual distinction of being the oldest employe, in point of service, of the company. He has been in one business 43 years—35 of them with the Jamestown corporation. He has never been late for work and has been absent because of illness only two days out of 15,965.

•

OSCAR BURTON, vice-president and general manager of the Gulf States Telephone Co. at Tyler, Texas, and president of the Texas Telephone Association, with Mrs. Burton went to the Davis Mountains for a vacation recently. While enroute they stopped at the association's office in Austin for a visit, business and social, with Secretary **GEORGE BUTLER.**

•

LT. COL. GEORGE IRVING BACK has become Signal Corps officer in charge of telephone communications defense planning with the army's general headquarters at the Army War College in Washington. Colonel Back is a native of Sioux City, Iowa, and had seven years' experience with the Bell System in both outside plant construction, and in the installation and maintenance of central office equipment. He entered the service in 1917 as a second lieutenant after winning his commission at an officers' training camp. He has had a wide and varied experience in war communications.

Bancroft Gherardi, Formerly Of A. T. & T., Dies

A heart attack caused the death on August 15 of Bancroft Gherardi of Short Hills, N. J., a former vice president and chief engineer of the American Telephone & Telegraph Co., while he was on vacation near Sudbury, Ontario, Can. He was 68 years old and had retired from active telephone service on April 30, 1938, after 43 years of notable service with the Bell System.

Devoting his entire business career to communications, Mr. Gherardi was honored with the 1932 Edison Medal

BANCROFT GHERARDI

"for contributions to the art of telephone engineering and development of electrical communication." He was one of 14 leading scientists elected to the National Academy of Science in 1933 and was chairman of the academy's engineering section from 1935 to 1938.

Mr. Gherardi was born in San Francisco, Calif., on April 6, 1873. His father was Rear Admiral Bancroft Gherardi who was navigator of the Niagara, which laid the American end of the first transatlantic cable in 1866. He was educated in the East, where his father's duties took him, and received the degree of B. Sc. from Polytechnic Institute in Brooklyn in 1891. Two years later he took his degree of M. E. from Cornell University and a year later his M. M. E.

In 1895 Mr. Gherardi entered upon his telephone career with the Metropolitan Telephone & Telegraph Co., parent of the New York Telephone Co. He advanced through various positions with both the New York Telephone Co. and the New York & New Jersey Telephone Co. In 1906 he went with the American Telephone & Telegraph Co., being promoted in 1909 to plant engineer in charge of plant development and standardization. He was made chief engineer in 1919 and was elected a vice president in 1920.

His engineering accomplishments included the construction of the Boston-Washington underground cable, the completion of three transcontinental lines, and the building of the New York-Chicago cable.

Brooklyn Polytechnic Institute conferred on him an honorary degree of Doctor of Engineering at its graduation in June, 1933, and he was similarly honored by the Massachusetts Institute of Technology in 1936.

He was a member of the American Institute of Electrical Engineers, of which he was president in 1927; the National Academy of Science, and the American Standards Association, an organization he headed in 1932.

He is survived by his widow. Burial took place at Short Hills, N. J.

"Hello Girl" Loses Job at 80

Nearly 81 years young, Mrs. Mary Greeninger, chief operator of the Denver, Pa., telephone exchange, on July 27, made the last connection at the switchboard she had tended faithfully for 29 years, and retired upon conversion of the exchange to dial service by the Denver & Ephrata T. & T. Co.

"Grandma," as she is affectionately known to everybody in town, did not want to retire yet. She would have liked to work at least another year in order to complete a 30-year record of service. As a matter of fact, she really prefers to go right on working indefinitely and plans now to find another position.

The Intelligencer Journal of Lancaster, Pa., recently carried an editorial comparing the alacrity of both Mrs. Greeninger and Henry Ford stating that people of 90 have a chance for success and usefulness if they will only look forward.

MRS. MARY GREENINGER

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Telephone companies whose net earnings persist at low levels will find in the switching key an effective means of stepping up average rate of return. Adapted to suitable wiring plans, it offers high service value and commands attractive rates. If you have not filed rates with your local regulatory commission for wiring plans, we urge you to do so.

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Commissions and Courts

Bond Issue Authorized At Carthage, Ill.

The Mississippi Valley Telephone Co. with main offices at Carthage, Ill., has been authorized by the Illinois Commerce Commission to issue $150,000 of first mortgage bonds for refunding purposes.

Proposed FCC Regulations for Continuing Property Records

In the near future the Federal Communications Commission plans to distribute a draft of proposed general requirements and regulations for a continuing property record for Class A and B telephone companies with a request that the industry submit its views by September 15. The proposed regulations do not include a division of present Class A companies requested by the United States Independent Telephone Association. It is stated that the regulations are general and liberal enough not to be burdensome.

Improvements Slated for Kentucky Exchange

J. F. Dees, sole proprietor of the Mount Vernon (Ky.) Telephone Co., has agreed to make $4,000 worth of repairs recommended after a survey by the Kentucky Public Service Commission, according to Hugh B. Bearden, consultant.

The one-man telephone exchange was attacked before the commission last May by a group of subscribers who demanded adequate service. Mr. Dees, his own attorney, countered with charges that his customers would not pay their bills, that the city would not let him set poles along Main Street, and that reconstruction of U. S. Highway 25 had torn up his lines to Livingston. He also asked that he be given permission to raise telephone rates.

The commission will entertain the motion for higher rates upon completion of the agreed repairs, it is reported. Mr. Dees has been granted 90 days to complete his improvement program. Out-of-pocket expenses should not cost Mr. Dees more than $1,500, according to Mr. Bearden, because he has all the poles and most of the wire already in stock.

Mr. Dees was asked to report progress twice a month, and a commission inspector will look over the improvements at the exchange at the end of 90 days.

The proposed increased rates are: At Mount Vernon, residence service, from $1.75 to $2.25; business service, from $2.75 to $3.50. At Brodhead and Livingston, residence from $1.50 to $2.25; business from $2.25 to $3.50.

Loses Court Appeal For New Trial

The Mansfield (Ohio) Telephone Co.'s motion for a new trial of a $10,035 judgment action against it was overruled August 5 in Richland county common pleas court, and the firm was ordered to pay that amount to the Ohio Bell Telephone Co.

The common pleas judge, C. H. Huston, ruled in favor of the Ohio Bell several weeks ago after the Mansfield firm had filed a cross-petition seeking a judgment for $1,596 against the plaintiff company.

The $10,035 judgment was awarded Ohio Bell on a claim for toll charges. In its answer and cross-petition, the Mansfield company contended it had offered to pay the claim after deducting the $1,596 it held was due it for floor space rental and other charges. The Ohio Bell company refused to accept payment on that basis, the Mansfield firm contended.

Toll Stations Requested At Louis, Okla.

Stating that local and long distance telephone service practically had been abandoned at the telephone exchange at Louis, Okla., the Southwestern Bell Telephone Co. on August 7 petitioned the Oklahoma Corporation Commission for permission to establish two toll stations at that point.

The petition states that the Louis exchange formerly was owned and operated by T. A. Sherift, deceased, and that the last Southwestern Bell toll contract was made with Willie

Sheriff, administrator of the estate. B. L. Dearing, who had been placed in charge of the exchange by the estate, had about eight telephones and on July 28 he stopped giving local and long distance calls excepting two or three emergency calls which he allowed to be put through three days later, the petition alleges.

The Southwestern Bell Telephone Co. states that at the time of its last statement, June 21, the exchange owed $141.95 as the Bell's share of toll business. The Southwestern Bell asks for permission to disconnect from the Louis exchange switchboard and establish the toll stations until accounts are settled and the commission decides what service should be given.

▼ ▼

Bond Issue Authorized For Illinois Company

The Illinois Commerce Commission at Springfield on August 14 authorized the Eastern Illinois Telephone Co., with main offices at Rantoul, to issue $125,000 in first mortgage bonds for refunding and improvements. The company operates in Rantoul, Thomasboro, Fisher, Gifford, Penfield, and adjoining territory.

▼ ▼

Summary of Commission Hearings and Rulings

Federal Communications Commission

August 12: Permission granted Philip O. Coffin for authority to hold positions as treasurer of the Chesapeake & Potomac Telephone Co., the Chesapeake & Potomac Telephone Co. of Baltimore City, the Chesapeake & Potomac Telephone Co. of Virginia and the Chesapeake & Potomac Telephone Co. of West Virginia.

Alabama Public Service Commission

July 31: Permission granted the Southern Bell Telephone & Telegraph Co. for construction and operation of a community dial telephone exchange to serve Childersburg, and surrounding territory.

Illinois Commerce Commission

August 14: Authority granted the Eastern Illinois Telephone Co., with main offices in Rantoul, to issue $125,000 in first mortgage bonds for refunding and improvements.

September 24: Hearing on proposed telephone rate cut between the Lawndale-Crawford and Berwyn areas of the Illinois Bell Telephone Co.

August 13: Authority granted the Illinois Bell Telephone Co. to increase rates in Greenville, Bond county.

August 13: Authority granted Mississippi Valley Telephone Co. with main offices at Carthage, to issue $150,000 of first mortgage bonds for refunding purposes.

August 13: Authority granted Danvers Telephone Co. to issue unsecured

(Please turn to page 33)

COMING CONVENTIONS

Three-state joint meeting of Maine, New Hampshire and Vermont Telephone Associations, Mount Washington Hotel, Bretton Woods, N. H., September 9, 10 and 11.

Arkansas Telephone Association, Arlington Hotel, Hot Springs, September 22 and 23.

Association of American Railroads, Telephone Section, Hotel Gibson, Cincinnati, Ohio, September 23, 24 and 25.

Telephone Pioneers of America, General Assembly, Hotel Stevens, Chicago, September 25, 26 and 27.

South Dakota Telephone Association, Hotel Carpenter, Sioux Falls, October 8 and 9.

United States Independent Telephone Association, Hotel Stevens, Chicago, October 14, 15, 16 and 17.

Independent Pioneer Telephone Association, Hotel Stevens, Chicago, October 16.

Virginia Independent Telephone Association, Hotel Roanoke, Roanoke, October 23 and 24.

North Carolina Independent Telephone Association, Pine Needles Inn, Southern Pines, October 27 and 28.

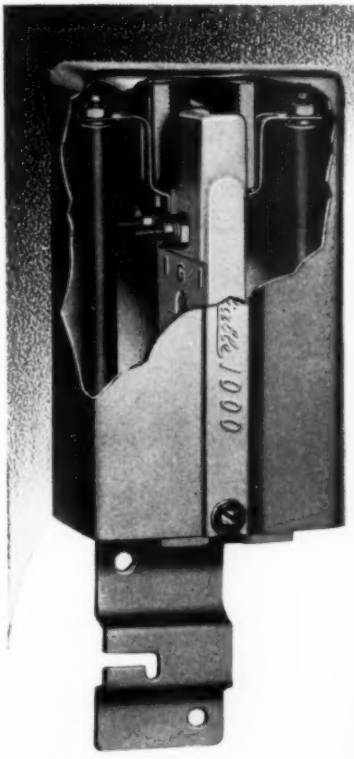
South Carolina Independent Telephone Association, November 3 and 4.

Florida Telephone Association, New Florida Hotel, Lakeland, November 7 and 8.

Alabama Independent Telephone Association, November 13 and 14.

Tennessee Independent Telephone Association, Hermitage Hotel, Nashville, November 17 and 18.

Kentucky Independent Telephone Association, December 2 and 3.



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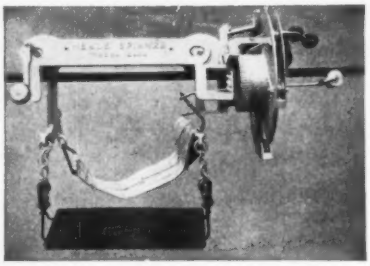

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MADISON, WISCONSIN

In the Nation's Capital

(Concluded from page 13)

classification of accounts for original cost determination. Much remains to be done, however.

(4) Stacked up against the regulatory accomplishments of the FCC state commission regulation makes a pretty poor showing. Although interstate revenues hardly exceed 15 per cent of the total revenues of the Bell System, it is doubtful whether the total annual intrastate reductions (for the whole country) in the past seven years exceed the annual reductions in interstate revenues. State commissions, on the record, simply have not been able to cope adequately with the telephone rate-making problem.

(5) In determining how the Communications Act should be changed with respect to telephone companies, public interest should be the guiding principle. We should not quibble over encroachments or extensions of state or Federal rights, respectively. The states should not insist upon their jurisdiction if, as a result of centralized control, public interest would better be served.

The following are specific points outlined by Booth for amendment of the Communications Act within the purview of the foregoing factors:

(1) The FCC ought to have authority to fix temporary rates. (Booth thinks the commission probably already has such authority. Indeed, rumor has it that he was preparing to have the commission exercise such authority before the recent Bell-FCC toll rate agreement came along.) It ought to be written into the act beyond the shadow of a doubt.

(2) Original cost ought to be the sole basis for fixing rates. This merely reasserts the position taken by the FCC in briefs before the U. S. Supreme Court. It would line up the commission along side of the FPC, which recently took a strong stand on this subject (reviewed in this department last week).

(3) The FCC's powers ought to be extended as far as public interest dictates. Here is the interesting legal device by which Booth would constitutionally justify the FCC going into local rate regulation. You will remember in the Consolidated Edison case (which Booth cites), the U. S. Supreme Court said that the NLRB had jurisdiction over the labor relations of a local utility serving New York city. This decision resulted in a legal anomaly: Consolidated Edison *is* engaged in interstate commerce for purposes of labor regulation. Consolidated Edison *is not* engaged in interstate commerce for purposes of utility regulation. What Booth would do would be to extend the theory of the Consolidated Edison decision to cover both kinds of regulation. Thus Booth would have Congress prohibit any telephone company operating in interstate commerce from collecting rates which would produce a return of more than 5 to 5½ per cent upon its net investment. As an alternative, Booth suggests that Congress might give the FCC discretion to regulate the earnings of a telephone company as a whole, if it determined that a segregation of its property as between intrastate and interstate commerce is not justified.

(4) The FCC ought to have authority to put into effect sliding-scale or profit-sharing arrangements similar to the so-called Washington plan which has been so successful in bringing down electric rates in the District of Columbia, with full approbation of both the public and the utility involved.

(5) Section 204 of the act authorizing the FCC to suspend proposed new telephone rates for periods not to exceed three months should be changed so that the period would be limited from nine to twelve months.

(6) The FCC should be given jurisdiction over telephone security issues. Booth points out that the A. T. & T. is the only large operating utility in the country whose securities are not regulated, except in a general way, by the registration provisions of the SEC.

(7) The act should be amended so as to require companies to file an application for rehearing before taking an appeal from an FCC order.

Answers to Traffic Questions on Page 16

1. The call should be handled by the toll center according to the present practice.
2. Enter the number first given in the called telephone number space and, following it, enter the second number preceded by "if DA call" your ticket will read "424 if DA call 425." All of this information is entered in the "Called Telephone Number" space.
3. No. The tributary should make attempts to reach the desired number at three-minute intervals.
4. The charge is quoted on all calls originating at coin-box stations and when requested by the calling or called station.
5. Yes.

Maintenance Practices

(Concluded from page 10)

may be measured to determine their resistance. The custom-built test set shown in *Fig. 17* is connected for measuring the resistance of ground rod "X." Several reasonably-priced test sets are now on the market which may be used to make this test. This particular test set has a built-in tone generator operating from a 1½ volt dry cell battery supply, a receiver for audible balancing, a three-position double-pole change-over switch and other necessary contact switches for balancing. There are also three terminal posts marked "RX" and "R" which are connected to test cords.

The reference grounds "R" and "R" are shown near the pole to facilitate the taking of the picture, but when actually measuring a ground, these reference rods should not be less than 20 feet from ground "X." The reference grounds are connected to terminals "R" and "R" and the rod under test to "X" on the test set.

The change-over switch is placed in position "A" and the set balanced. The switch is then changed to "B" and balanced and the results of the two readings added. The switch is then moved to position "C" and this reading subtracted from the sum of the "A" and "B" reading and divided by two. This simple formula is stated as follows: $\frac{A + B - C}{2}$.

Anyone familiar with simple problems in addition, subtraction and division will be able to make accurate measurements with this set without difficulty.

The following indicates results of an actual test made with this instrument:

$A = 20$
$B = 22$
$C = 31$
$X = \frac{20 + 22 - 31}{2} = 5\frac{1}{2}$ ohms

A ground connection measuring this low would be considered satisfactory for all purposes, except for central office grounding. When it is not possible to obtain a satisfactory ground by the use of a single rod, several may be installed as shown in *Figs. 18, A, B, and C.* This arrangement is often preferred to a soil treatment method of a single element as it eliminates the use of materials which usually shorten the life of the rod.

When in doubt a good procedure is to drive one rod and test for resistance and if not satisfactory drive another. If, after testing again, the resistance is still high, a third rod may be installed. Next connect the two or three rods in multiple with a wire of sufficient mechanical strength and bury the wire in a trench. The rods should be driven down so that their tops are nearly level with the bottom of the trench.

(To be continued)

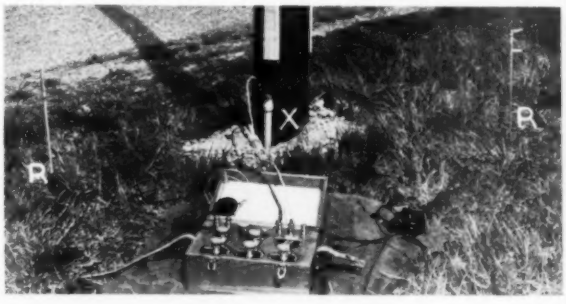

Fig. 17. Test set used to measure resistance of ground connections.

Fig. 18. Method of installing several ground rods in multiple.

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XUM

"Telephony's" Engineering Data

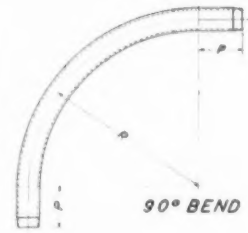
By J. Ernest Hartz

Index, Underground Conduit Construction. August 23, 1941. No. 4-B, page 3.

Conduit and Materials

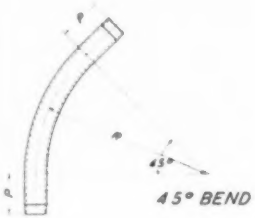
Asbestos-Cement Conduit (ctd.)

Bends: *Conduit bends* of the size and type required should be selected from the following table:



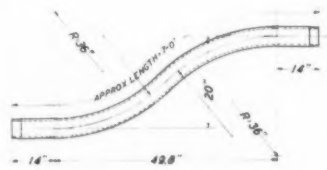
SIZE	STANDARD RADII 18" R=5'	24" R=11'	36" R=15'	48" R=18'
2	×	×	×	–
2½	×	×	×	–
3	–	×	×	–
3½	–	–	×	–
4	–	–	×	×
4½	–	–	×	×
5	–	–	–	×
6	–	–	–	×

APPROX. OVERALL LENGTH OF BEND ALONG CENTERLINE
18" R = 5'-0"
24" R = 5'-0"
36" R = 7'-0"
48" R = 9'-0"



SIZE	STANDARD RADII 18" R=5'	24" R=8'0"	36" R=15'	48" R=11'
2	×	×	×	–
2½	×	×	×	–
3	–	×	×	–
3½	–	–	×	–
4	–	–	×	×
4½	–	–	×	×
5	–	–	–	×
6	–	–	–	×

APPROX. OVERALL LENGTH OF 45° BENDS ALONG CENTERLINE 5'-0"
SIZE INDICATES NOMINAL I.D. OF CONDUIT INCHES



STANDARD OFF SET BEND. (x indicates available; – indicates not available.)

"Telephony's" Engineering Data

By J. Ernest Hartz

Index, Underground Conduit Construction. August 23, 1941. No. 4-B, page 4.

Caps: *Caps* for closing dead ends of conduit.

Pole riser caps.

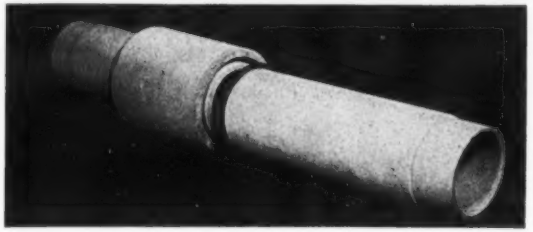
"Telephony's" Engineering Data

By J. Ernest Hartz

Index, Underground Conduit Construction. August 23, 1941. No. 4-B, page 5.

Compound: *Conduit sealing compound* for waterproofing the joints in conduit, patching holes, etc. Conveniently supplied in 25 lb. cans, also in 1, 5, 10, and 50 lb. cans and in 150 and 300 lb. drums.

Connectors: *Center-made-up connectors:* To join two duct runs laid from opposite directions and thus facilitate rapid installation. May also be used to connect a line to an end bell which has already been installed.



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Summary of Commission Hearings and Rulings

(Concluded from page 29)

promissory notes in the amount of $5,425 to refund other notes.

Minnesota Railroad & Warehouse Commission

July 25: Hearing on evidence submitted by Northwestern Bell Telephone Co. tending to show that returns in the Bemidji exchange did not permit a fair return on invested capital and are not on a parity with returns in similar communities.

July 28: Hearing on application of Northwestern Bell Telephone Co. for approval of a change of rates at Mora.

September 5: Hearing on application by Northwestern Bell Telephone Co. for approval of a change of rates at Grand Rapids.

Nebraska State Railway Commission

September 20: The Northwestern Bell Telephone Co. ordered to show cause why an order should not be entered fixing the over-all composite depreciation rate to be applied by the company at not to exceed 3.11 per cent.

A similar order was issued upon the Platte Valley Telephone Corp. of Scottsbluff, which is to show cause by September 27 why its over-all composite depreciation rate shall not be fixed at 3.9 per cent.

The commission recently fixed those of the Lincoln Telephone & Telegraph Co. and of the Nebraska Continental Telephone Co. of Columbus at 3.5 per cent.

September 25: Hearing on application of the Bertrand Telephone Co. for validation of an issue of $3,000 of notes.

Ohio Public Utilities Commission

August 16: Application filed by H. M. Fultz, mayor of College Corner, jointly with Thomas H. Miller as subscribers of the College Corner Telephone Co. for a rehearing of the order of July 29 which authorized the company to increase its rates, effective August 1.

Wisconsin Public Service Commission

August 18: Hearing at Madison on investigation of alleged refusal of Union Grove Telephone Co. to extend service to Felix Peter.

August 19: Application of Wisconsin Telephone Co. for authority to revise its rates for service in the Williams Bay area of its Lake Geneva exchange.

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BOOK REVIEW

I LIVE ON AIR, by A. A. Schechter and Edward Anthony; 454 pages, 9½ by 6½ inches; 64 full-page reproductions of photographs; published by Frederick A. Stokes Co., New York City; price $3.75.

With radio having assumed such a vital role in presenting information and opinion on the tremendous events of the day, this book will be particularly appreciated by those who would like to know how news broadcasting is done.

The book recounts the experiences of Mr. Schechter, who is news and special events director of the National Broadcasting Co. In the early days of radio news broadcasting, radio men had no access to newspaper wire services, and relied almost exclusively on the telephone for their information. The book relates several dramatic—and amusing incidents in which the enterprise radio men "scooped" the newspapers, using the telephone to follow up tips. " . . . I consider the telephone the greatest invention the world has ever known," Mr. Schechter says.

In a chapter on flood broadcasts, the authors pay tribute to the heroism of telephone crews in times of national emergency and their cooperation with radio men to make broadcasting possible. "Disaster after disaster over a period of years has seen these men performing almost superhuman feats to make broadcasting possible. Much of the credit given us for getting the news through, when ordinary means of communications fail, belongs to them."

* *

PUBLIC UTILITY ECONOMICS, by C. Woody Thompson and Wendell R. Smith; 727 pages, 6 ins. by 9 ins.; 39 charts and 74 tables; published by the McGraw-Hill Book Co., New York; price, $4.50.

Designed primarily as a textbook for advanced students of economics and commerce, this book seeks to acquaint the reader with the place which public utilities occupy in our economic system. Though designed especially for college students, it may be found useful by utility executives who wish to have a broader understanding of the problems and importance of their business as a whole.

The four general sections of the book cover some of the fundamental aspects of the utility business; the agencies of regulation; the problems of regulation, and a number of special studies. Among the latter are discussions of taxation and utility service in rural communities. The question of public or private ownership is discussed in an impartial and unbiased manner.

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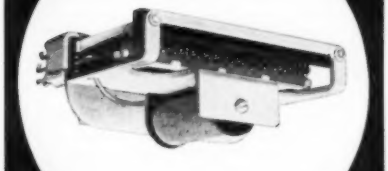

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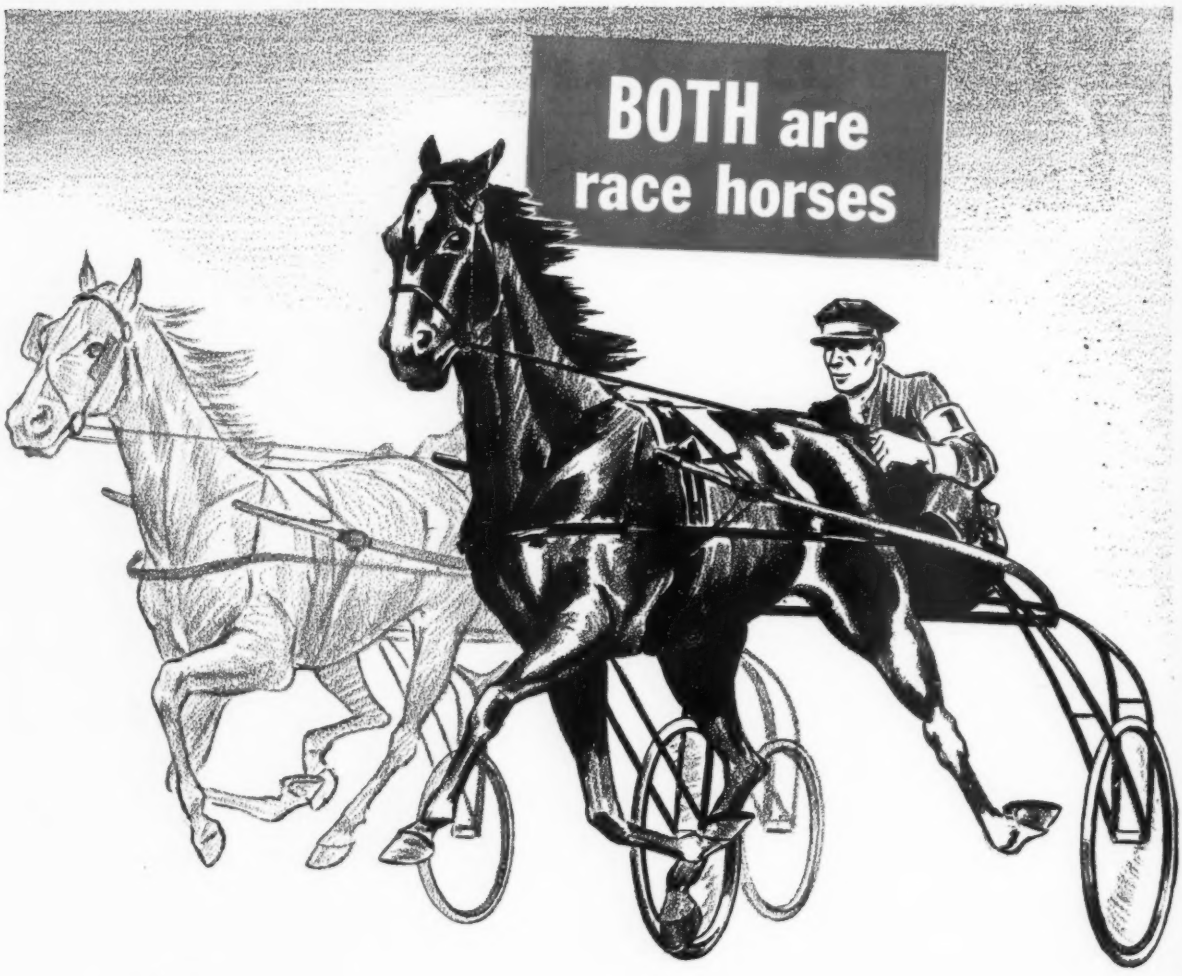

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